



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Colorado State University

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *eighteen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. IN THE UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS CONTAINED BY THE OWNER OF THE RIGHTS: (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

COMMON WHEAT

'Duke'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington this 11th day of March in the year of our Lord one thousand nine hundred and eighty-two.

Attest:

Kenneth A. Evers

Acting
Commissioner
Plant Variety Protection Office
Grain Division
Agricultural Marketing Service

John R. Block
Secretary of Agriculture



UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK, POULTRY, GRAIN & SEED DIVISION

FORM APPROVED
OMB NO. 40-R3822

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

INSTRUCTIONS: See Reverse.

No certificate for plant variety protection may be issued unless a completed application form has been received (5 U.S.C. 553).

1a. TEMPORARY DESIGNATION OF VARIETY CO 741232		1b. VARIETY NAME Duke		FOR OFFICIAL USE ONLY	
				PV NUMBER 8100153	
2. KIND NAME Wheat, Common		3. GENUS AND SPECIES NAME Triticum aestivum L.		FILING DATE 8/10/81	TIME 10:00 A.M.
4. FAMILY NAME (BOTANICAL) Gramineae		5. DATE OF DETERMINATION September 1, 1980		FEE RECEIVED \$ 500.00 \$ 250.00	DATE 8/10/81 11/16/81
6. NAME OF APPLICANT(S) Colorado State University		7. ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code) C3 Plant Sciences Bldg. Colorado State University Fort Collins, CO 80523		8. TELEPHONE AREA CODE AND NUMBER (303) 491-6483 (303) 491-6202	
9. IF THE NAMED APPLICANT IS NOT A PERSON, FORM OF ORGANIZATION: (Corporation, partnership, association, etc.) Colorado State University		10. IF INCORPORATED, GIVE STATE AND DATE OF INCORPORATION 10/19/81		11. DATE OF INCORPORATION 10/13/81	
12. NAME AND MAILING ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS: Gerald Ellis and James Quick; C135 C3 Plant Sciences Bldg. Colorado State University Fort Collins, CO 80523					

13. CHECK BOX BELOW FOR EACH ATTACHMENT SUBMITTED:

- ☒ 13A. Exhibit A, Origin and Breeding History of the Variety (See Section 52 of the Plant Variety Protection Act.)
- ☒ 13B. Exhibit B, Novelty Statement.
- ☒ 13C. Exhibit C, Objective Description of the Variety (Request form from Plant Variety Protection Office.)
- ☒ 13D. Exhibit D, Additional Description of the Variety.

14a. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? (See Section 83(a). (If "Yes," answer 14B and 14C below.)		<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
14b. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?	14c. IF "YES," TO 14B, HOW MANY GENERATIONS OF PRODUCTION BEYOND BREEDER SEED?		
<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	<input checked="" type="checkbox"/> FOUNDATION <input checked="" type="checkbox"/> REGISTERED <input checked="" type="checkbox"/> CERTIFIED		
15a. DID THE APPLICANT(S) FILE FOR PROTECTION OF THIS VARIETY IN OTHER COUNTRIES? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO (If "Yes," give name of countries and dates.)			
15b. HAVE RIGHTS BEEN GRANTED THIS VARIETY IN OTHER COUNTRIES? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO (If "Yes," give name of countries and dates.)			

16. DOES THE APPLICANT(S) AGREE TO THE PUBLICATION OF HIS/HER (THEIR) NAME(S) AND ADDRESS IN THE OFFICIAL JOURNAL? ☒ YES ☐ NO

17. The applicant(s) declare(s) that a viable sample of basic seed of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

April 6, 1981
(DATE)

Gerald H. Ellis
(SIGNATURE OF APPLICANT)

May 13, 1981
(DATE)

James Quick
(SIGNATURE OF APPLICANT)

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8100153

13A. Exhibit A - Origin and Breeding History of the Variety

Wheat Variety - Duke

Pedigree - Sonora 64*3/Trapper/5/Scout/4/Quevera/3/Tenmark//Marquis/Oro

The final crosses (three-way) were made in 1966 and 1967. The cross from which Duke was selected was evaluated as a bulk in the F₂ through F₄, and spike rows were simultaneously grown in the F₃ and F₄. Based on the bulk hybrid performance, spike rows were selected, spikes within selected rows were chosen for the next generation of spike rows, and the remainder of the row was bulked to provide seed for the next generation of bulk yield testing. A selection from this cross, C0695552, was bulked as an F₄ line in 1969. C0695552 was tested in the Southern Regional Performance Nursery (SRPN) in 1971 and 1973. Variability for stem and leaf rust and winter hardiness was noted within C0695552 and 18 selections were made in 1973. The seventh selection was assigned C0741232 and tested in the Colorado variety trial in 1977-81 and in the SRPN in 1978 and 1979.

Duke appeared stable and uniform through the seed increase program. Tall off-types with darker glume color appear approximately 1:100,000.

Mr. Larry W. Dosier
October 16, 1981
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Exhibit B: Novelty Statement

delete existing and replace with:


Duke is most similar to Sandy and Centurk; however, it has lighter green and narrower leaves than either Centurk or Sandy. Duke is 1 to 3 days earlier in heading than Centurk and has a longer mixing time and a higher percent vitreous kernels than Centurk. The phenol reaction for seed color is brown-black for Duke and brown for Sandy.

Exhibit C:

phenol reaction for Duke is brown-black

Please notify me if there are further questions.

Sincerely,



James S. Quick
Professor

JSQ:cb

attachments

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK, POULTRY, GRAIN & SEED DIVISION
BELTSVILLE, MARYLAND 20705

EXHIBIT C
(Wheat)

OBJECTIVE DESCRIPTION OF VARIETY
WHEAT (TRITICUM SPP.)

INSTRUCTIONS: See Reverse.

NAME OF APPLICANT(S) COLORADO STATE UNIVERSITY	FOR OFFICIAL USE ONLY PVPO NUMBER 8100153
ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code) C3 Plant Science Building Colorado State University Fort Collins, CO 80523	VARIETY NAME OR TEMPORARY DESIGNATION Duke

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (e.g., or) when number is either 99 or less or 9 or less.

1. KIND:

1 = COMMON 2 = DURUM 3 = EMMER 4 = SPELT 5 = POLISH 6 = POULARD 7 = CLUB

2. TYPE:

1 = SPRING 2 = WINTER 3 = OTHER (Specify) _____ 1 = SOFT 3 = OTHER (Specify) _____
2 = HARD

1 = WHITE 2 = RED 3 = OTHER (Specify) _____

3. SEASON - NUMBER OF DAYS FROM EMERGENCE TO:

FIRST FLOWERING LAST FLOWERING

4. MATURITY (50% Flowering):

NO. OF DAYS EARLIER THAN 1 = ARTHUR 2 = SCOUT 3 = CHRIS
 162-161 NO. OF DAYS LATER THAN 4 = LEMHI 5 = NUGAINES 6 = LEEDS

5. PLANT HEIGHT (From soil level to top of head):

CM. HIGH
 CM. TALLER THAN 1 = ARTHUR 2 = SCOUT 3 = CHRIS
CM. SHORTER THAN 4 = LEMHI 5 = NUGAINES 6 = LEEDS

6. PLANT COLOR AT BOOTING (See reverse):

1 = YELLOW GREEN 2 = GREEN 3 = BLUE GREEN

7. ANTER COLOR:

1 = YELLOW 2 = PURPLE

8. STEM:

Anthocyanin: 1 = ABSENT 2 = PRESENT Waxy bloom: 1 = ABSENT 2 = PRESENT
 Hairiness of last internode of rachis: 1 = ABSENT 2 = PRESENT Internodes: 1 = HOLLOW 2 = SOLID
 NO. OF NODES (Originating from node above ground) CM. INTERNODE LENGTH BETWEEN FLAG LEAF AND LEAF BELOW

9. AURICLES:

Anthocyanin: 1 = ABSENT 2 = PRESENT Hairiness: 1 = ABSENT 2 = PRESENT

10. LEAF:

Flag leaf at booting stage: 1 = ERECT 2 = RECURVED Flag leaf: 1 = NOT TWISTED 2 = TWISTED
3 = OTHER (Specify): _____
 Hairs of first leaf sheath: 1 = ABSENT 2 = PRESENT Waxy bloom of flag leaf sheath: 1 = ABSENT 2 = PRESENT
 MM. LEAF WIDTH (First leaf below flag leaf) CM. LEAF LENGTH (First leaf below flag leaf)

11. HEAD:

☐ 2 Density: 1 = LAX 2 = DENSE
 ☐ 1 Shape: 1 = TAPERING 2 = STRAP 3 = CLAVATE
 4 = OTHER (Specify) _____

☐ 4 Awedness: 1 = AWNLESS 2 = APICALLY AWNLETED 3 = AWNLETED 4 = AWNED

☐ 1 Color at maturity: 1 = WHITE 2 = YELLOW 3 = PINK 4 = RED
 5 = BROWN 6 = BLACK 7 = OTHER (Specify): _____

☐ 0 ☐ 8 CM. LENGTH
 ☐ 1 ☐ 0 MM. WIDTH

12. GLUMES AT MATURITY:

☐ 1 Length: 1 = SHORT (CA. 7 mm.) 2 = MEDIUM (CA. 8 mm.)
 3 = LONG (CA. 9 mm.)
 ☐ 2 Width: 1 = NARROW (CA. 3 mm.) 2 = MEDIUM (CA. 3.5 mm.)
 3 = WIDE (CA. 4 mm.)

☐ 2 Shoulder shape: 1 = WANTING 2 = OBLIQUE 3 = ROUNDED
 4 = SQUARE 5 = ELEVATED 6 = APICULATE
 ☐ 3 Beak: 1 = OBTUSE 2 = ACUTE 3 = ACUMINATE

13. COLEOPTILE COLOR:

☐ 1 1 = WHITE 2 = RED 3 = PURPLE

14. SEEDLING ANTHOCYANIN:

☐ 1 1 = ABSENT 2 = PRESENT

15. JUVENILE PLANT GROWTH HABIT:

☐ 2 1 = PROSTRATE 2 = SEMI-ERECT 3 = ERECT

16. SEED:

☐ 3 Shape: 1 = OVATE 2 = OVAL 3 = ELLIPTICAL
 ☐ 1 Cheek: 1 = ROUNDED 2 = ANGULAR

☐ 2 Brush: 1 = SHORT 2 = MEDIUM 3 = LONG
 10/16/81 ☒ 2

☒ 5 Phenol reaction (See instructions): 1 = IVORY 2 = FAWN 3 = LT. BROWN
 4 = BROWN 5 = BLACK
 *Phenol reaction results will be reported later

☐ 3 Color: 1 = WHITE 2 = AMBER 3 = RED 4 = PURPLE 5 = OTHER (Specify) _____

☐ 0 ☐ 6 MM. LENGTH
 ☐ 0 ☐ 3 MM. WIDTH
 ☐ 3 ☐ 0 GM. PER 1000 SEEDS

17. SEED CREASE:

☐ 1 Width: 1 = 60% OR LESS OF KERNEL 'WINOKA'
 2 = 80% OR LESS OF KERNEL 'CHRIS'
 3 = NEARLY AS WIDE AS KERNEL 'LEMHI'
 ☐ 1 Depth: 1 = 20% OR LESS OF KERNEL 'SCOUT'
 2 = 35% OR LESS OF KERNEL 'CHRIS'
 3 = 50% OR LESS OF KERNEL 'LEMHI'

18. DISEASE: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

☐ 1 STEM RUST (Races) B17 ☐ 0 LEAF RUST (Races) ☐ 0 STRIPE RUST (Races) ☐ 0 LOOSE SMUT
 mixture

☐ 1 POWDERY MILDEW ☐ 0 BUNT ☐ OTHER (Specify) _____

19. INSECT: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

☐ 0 SAWFLY ☐ 0 APHID (Bydv.) ☐ 0 GREEN BUG ☐ 0 CEREAL LEAF BEETLE

☐ OTHER (Specify) _____ HESSIAN FLY RACES:

☐ GP ☐ A ☐ B ☐ C
☐ D ☐ E ☐ F ☐ G

20. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED:

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant tillering	Scout 66	Seed size	Scout 66
Leaf size	Centurk	Seed shape	Scout 66
Leaf color	Centurk	Coleoptile elongation	Scout 66
Leaf carriage	Centurk	Seedling pigmentation	Scout 66

INSTRUCTIONS

GENERAL: The following publications may be used as a reference aid for the standardization of terms and procedures for completing this form:

- (a) L.W. Briggie and L. P. Reitz, 1963, Classification of Triticum Species and Wheat Varieties Grown in the United States, Technical Bulletin 1278, United States Department of Agriculture.
- (b) W.E. Walls, 1965, A Standardized Phenol Method for Testing Wheat Seeds for Varietal Purity, contribution No. 28 to the handbook of seed testing prepared by the Association of Official Seed Analysts. (See attachment.)

LEAF COLOR: Nickerson's or any recognized color fan should be used to determine the leaf color of the described variety.

13D. Exhibit D - Additional Description of the Variety

Summary Novelty Statement

Crop - Hard red winter wheat (Triticum aestivum L.)

Variety - Duke

General Information - Colorado State University has released Duke, a standard height variety adapted to the high plains. Duke is most similar to Centurk, but is earlier than Centurk. Duke combines the high yield potential of its semidwarf parents with the ability to withstand moisture stress during emergence and seedling growth from its standard height parents.

Variety Description - Duke is 1 to 3 days ($P < .01$) earlier than Centurk. Duke may be shorter than Centurk depending upon the environment. Most importantly, Duke has outyielded Centurk significantly ($P < .01$) some years at some locations. Duke has a longer mixing time than Centurk. The "yellow berry" character has not been observed in Duke but this character is common in seed samples of Centurk from some locations that are low in soil nitrate.

Table 1. Nursery Yield Results 1971

Nine Location Summary		
<u>Variety</u>	<u>CO Number</u>	<u>Bu/Acre</u>
Duke	C0695552	37.1
Centurk	--	36.3

Values are significantly different at the $P < .05$ level

Table 2. Plant Height 1980 at Fort Collins

<u>Variety</u>	<u>CO Number</u>	<u>Inches</u>
Duke	C0741232	37.9
Centurk	--	38.8

Values are significantly different at the $P < .05$ level

Table 3. Heading Date 1980 at Fort Collins

<u>Variety</u>	<u>CO Number</u>	<u>Days to Heading from Jan. 1</u>
Duke	C0741232	162
Centurk	--	164

Values are significantly different at the $P < .05$ level

APPLICATION NO. 8700153

VARIETY NAME DUKE

Test Results Based on the American Association of Cereal Chemists Approved Method (AACC)

1. Straight dough development time ratio:

Farino graph -

Dough-Mixer -

2.

Baking Ingredients	Arrival time-- minutes	Peak time	Stability-- minutes	Curve center height B.U.	Height at end B.U.
Yeast					
No rest	ONLY MIXOGRAM DATA AVAILABLE				
4 hr. rest					

3. Protein percentage 13.5 (14% H₂O)